UNITED
NATIONS

ST

Secretariat

Distr
GENERAL

ST/SG/AC.10/C.3/1997/65
26 September 1997

Original: ENGLISH

COMMITTEE OF EXPERTS ON THE
TRANSPORT OF DANGEROUS GOODS

**Sub-Committee of Experts on the
Transport of Dangerous Goods
(Fourteenth session,
Geneva, 8-18 December 1997,
agenda item 4 (b))**

GLOBAL HARMONISATION OF SYSTEMS OF CLASSIFICATION AND LABELLING OF CHEMICALS

Physical hazards

Organic peroxides: explosive properties

Transmitted by the European Chemical Industry Council (CEFIC)

1. Introduction

During the meetings of the joint ILO/UN-Committee Working group on Harmonised classification criteria for flammability and reactivity held in 1995/1997, the determination of the hazardous properties of organic peroxides, including explosibility, should be based on the UN manual of tests and criteria, test series A-H, see report of the working group on reactivity, document ST/SG/AC.10/23/Add.4.

This classification procedure implies that organic peroxides are classified into high and low hazardous types (organic peroxide type A to type G). Type A and type B are recognised as having explosive properties.

Based on the consensus achieved in the working group on reactivity on the testseries to be applied for organic peroxides, CEFIC proposes to assign explosive properties to organic peroxide type A and organic peroxide type B and to use an appropriate risk phrase for type C in the global harmonized system, for reasons as outlined in this proposal.

2. Justification of the proposal

In the global harmonized system, organic peroxides will be tested by the UN test series A to H. In this classification procedure, a series of tests have to be performed to determine the detonation, deflagration and thermal explosion properties. In the final assignment of an organic peroxide reacting violently in the laboratory scale tests, the execution of packaging tests is required.

In case the peroxide shows detonation or rapid deflagration in the packaging the product is forbidden for transport and classified as **type A** because of its explosive properties. In case the peroxide passes these packaging test, but based on the laboratory scale tests can detonate or deflagrate rapidly, it is classified as **type B**, and should bear an explosive label.
In case the peroxide shows violent thermal explosion in the packaging a subsidiary explosion hazard is assigned and as a consequence, the product is also classified as **type B** and should bear an explosive label.

Considering this UN classification procedure, the assignment of explosive properties (and application of explosive label) is partly based on results of tests performed with the peroxide in its commercial packaging.
In the global harmonized classification system, this way of assigning explosive properties to organic peroxides type A and type B is reasonable for transport and storage circumstances; in these two "handling phases" the product remains in its commercial package 1/.

Under a degree of confinement higher than that of the peroxide in its packaging (e.g. handling in dosing vessels, dosing lines, pumping systems, extruders etc.) some other organic peroxides may show explosive properties. This condition occurs only under processing conditions. In industry, special preventive and protective measures are issued for processing purposes. This is however not part of the global harmonization.

Nevertheless, for the products which pass the packaging tests (type C peroxides) the hazard of explosion under higher degree of confinement hazard can be communication to users of the peroxide. A risk phrase like the "**Risk of explosion if heated under confinement**" currently used in the EU regulation can be useful.

1/ *Organic peroxide storage regulations generally prescribe the use of the packaging as used for transport.*

In conclusion, CEFIC is of the opinion that the use of a hazard communication phrase in line with the current EU R44 risk phrase for organic peroxide type C and the use of this phrase together with an explosive label for organic peroxide type A and type B, is a reasonable approach for assigning explosive properties to organic peroxides and facilitates the development of a global harmonisation of classification systems.

3. Proposal

Based on the consensus reached by the working group on reactivity, the UN classification procedure will be applied for organic peroxides in the harmonised classification system (test series A-H).

In this system substances are classified into more or less hazardous organic peroxide types (organic peroxide type A to type G). As a result of this classification and based on the arguments given in section 2, CEFIC proposes the following to harmonise the assignment of explosive properties to organic peroxides:

1) *Assign to organic peroxide type A and type B:*

- explosive properties and consequent explosive labelling
- a hazard communication phrase (risk phrase) in line with current EU R44 "Risk of explosion if heated under confinement"

2) *Assign to organic peroxide type C:*

- a hazard communication phrase (risk phrase) in line with current EU R44 "Risk of explosion if heated under confinement"

A similar assignment approach of explosive properties for self-reactive substances of class 4.1 could be valid.